

CLAIMS

We claim:

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1. A color-stable, pigmented optical body comprising a single or multiple layer core comprising at least one layer of a thermoplastic polymer material having dispersed therein a particulate pigment, wherein the optical body exhibits a transmission of light within a wavelength band of interest within the visible spectrum of from about 10 to about 90 percent and exhibits an internal haze of less than or equal to about five percent internal haze.
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2. The optical body of claim 1 further comprising at least one additional layer that is substantially free of particulate pigmentation.
3. The optical body of claim 2 wherein said additional layer is a transparent coating, laminate or film.
4. The optical body of claim 1 wherein said optical body exhibits less than about three percent internal haze.
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5. The optical body of claim 1 wherein said optical body exhibits less than about two percent internal haze.
6. The optical body of claim 1 wherein said optical body has a total haze of less than about ten percent.
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7. The optical body of claim 1 wherein said optical body has a surface roughness, R_a , of less than or equal to about 60 nm.
8. The optical body of claim 1 wherein said particulate pigment comprises carbon black.

9. The optical body of claim 1 wherein said particulate pigment comprises a material selected from the group consisting of oxides, salts and compounds of iron, titanium, antimony, zirconium, zinc, barium, calcium, cadmium, lead, chromium, molybdenum, manganese, silicon, aluminum, sodium, cobalt, copper, iron oxides, ammonium ferrocyanides, titanium dioxides, antimony oxides, zirconium oxides, zirconium silicates, zinc oxides, zinc sulfides, barium sulfates, calcium carbonates, calcium sulfates, cadmium sulfides, cadmium selenides, lead sulfates, chromium oxides, chromates, molybdates, manganates, silica, silicates, aluminosilicates, sodium aluminosulphosilicates, simple and complex inorganic compounds and inorganic complexes, phthalocyanines, copper phthalocyanines, quinacridones, anthraquinones, perylenes, perinones, dioxazines, diketo-pyrrolo-pyrrols (DPPs), indanthrones, benzidines, isoindolines and isoindolinones, benzimidazolones, azo, disazo, or polyazo pigments, and blends or mixtures thereof.

15 10. The optical body of claim 1 wherein said thermoplastic polymer material has dispersed within it two or more particulate pigments.

11. The optical body of claim 1 wherein said thermoplastic polymer material has dispersed within it carbon black and at least one blue pigment or dye.

12. The optical body of claim 1 wherein said thermoplastic polymer
20 material comprises a condensation polymer.

13. The optical body of claim 1 wherein said thermoplastic polymer material comprises a polyester.

14. The optical body of claim 1 wherein said thermoplastic polymer material comprises a polyester comprising terephthalate monomer units.

15. The optical body of claim 1 wherein said thermoplastic polymer material comprises a polyester comprising naphthalate monomer units.

5 16. The optical body of claim 1 wherein said thermoplastic polymer material comprises a polyester selected from the group consisting of polyethylene naphthalate, polyethylene terephthalate, polycarbonates, polyarylates, polybutylene naphthalate, polypropylene naphthalate, polybutylene terephthalate, polypropylene terephthalate, and blends and copolymers of any of the above with each other or with other polymers.

10 17. The optical body of claim 1 wherein said single multiple layer core is oriented.

18. The optical body of claim 2 wherein said additional layer comprises an oriented film.

19. The optical body of claim 1 wherein said single or multiple layer core comprises a multilayer optical film.

15 20. The optical body of claim 1 wherein said additional layer comprises a multilayer optical film.

21. An article comprising the pigmented optical body of claim 1.

22. An infrared mirror comprising the pigmented optical body of claim

20 23. A window glazing film comprising the pigmented optical body of claim 1.

24. A puncture resistant film comprising the pigmented optical body of claim 1

25. A solar control film comprising the pigmented optical body of claim 1

26. A security film comprising the pigmented optical body of claim 1

27. A contrast enhancement film comprising the pigmented optical body of claim 1

28. A display device comprising a display device whose external viewing surface is configured to comprise the contrast enhancement film of claim 1

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29. A display device comprising the optical body of claim 1

30. A traffic sign comprising the optical body of claim 1

31. A color-stable, pigmented optical body comprising a single or multiple layer core comprising at least one layer of a thermoplastic polymer material having dispersed therein a particulate pigment, wherein the optical body exhibits an average transmission of light within the visible spectrum of from about 10 to about 90 percent and exhibits an internal haze of less than or equal to about five percent.

32. A color-stable, pigmented optical body comprising a single or multiple layer core comprising at least one layer of a thermoplastic polymer material, wherein dispersed within the polymer material is between 0.01 and about 1.0 percent by weight of a particulate pigment having a mean diameter of between about 10 nm and 500 nm, and wherein the optical body exhibits a transmission of

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light within a wavelength band of interest within the visible spectrum of from about 10 to about 90 percent.

33. The optical body of claim 32 further comprising at least one additional layer that is substantially free of particulate pigmentation.

5 34. The optical body of claim 33 wherein said additional layer is a transparent coating, laminate or film.

35. The optical body of claim 32 wherein said optical body has an internal haze of less than about five percent.

10 36. The optical body of claim 32 wherein said optical body has a total haze of less than about ten percent.

37. The optical body of claim 32 wherein said optical body has a surface roughness, R_a , of less than or equal to about 60 nm.

38. The optical body of claim 33 wherein said optical body has a surface roughness, R_a , of less than or equal to about 30 nm.

15 39. The optical body of claim 32 wherein said particulate pigment is present in the thermoplastic polymer material in an amount between about 0.02 and about 0.5 percent by weight.

40. The optical body of claim 32 wherein said particulate pigment has a mean diameter of between about 20 nm and 100 nm.

20 41. The optical body of claim 32 wherein said particulate pigment comprises carbon black.

42. The optical body of claim 32 wherein said thermoplastic polymer material comprises a condensation polymer.

43. The optical body of claim 32 wherein said thermoplastic polymer material comprises a polyester.

44. The optical body of claim 32 wherein said thermoplastic polymer material comprises a polyester selected from the group consisting of polyethylene naphthalate, polyethylene terephthalate, polycarbonates, polyarylates, polybutylene naphthalate, polypropylene naphthalate, polybutylene terephthalate, polypropylene terephthalate, and blends and copolymers of any of the above with each other or with non-polyester polymers.

45. The optical body of claim 32 wherein said single multiple layer core is oriented.

46. The optical body of claim 32 wherein said additional layer comprises an oriented film.

15 47. The optical body of claim 32 wherein said single or multiple layer
core comprises a multilayer optical film.

48. The optical body of claim 32 wherein said additional layer comprises a multilayer optical film.

49. An article comprising the pigmented optical body of claim 32.

20 50. An infrared mirror comprising the pigmented optical body of claim
32. _____

51. A window glazing film comprising the pigmented optical body of claim 32.

52. A puncture resistant film comprising the pigmented optical body of claim 32.

53. A solar control film comprising the pigmented optical body of claim 32.

54. A security film comprising the pigmented optical body of claim 32.

55. A contrast enhancement film comprising the pigmented optical body of claim 32.

56. A display device comprising a display device whose external viewing surface is configured to comprise the contrast enhancement film of claim 32.

57. A color-stable, pigmented optical body comprising a single or multiple layer core comprising at least one layer of a thermoplastic polymer material having dispersed therein carbon black, wherein the optical body exhibits a transmission of light within a wavelength band of interest within the visible spectrum of from about 10 to about 90 percent.

58. A color-stable, pigmented optical body comprising a single or multiple layer core comprising at least one layer of a thermoplastic polymer material having dispersed therein a particulate pigment, wherein the optical body has a surface roughness, R_a , of less than about 30 and exhibits a transmission of light within a wavelength of interest within the visible spectrum of about 10 to about 90 percent.

59 A color-stable, pigmented optical body, the method comprising:

(a) creating a substantially uniform dispersion of a particulate pigment having a mean diameter of between about 10 nm and about 500 nm;

(b) adding the dispersion to a reaction mass of a condensation polymer forming process, wherein the dispersion is present in an amount sufficient to impart a transparency to the optical body between about 10 and 90 percent;

(c) reacting the condensation polymer forming reaction mass to form a condensation polymer having dispersed therein the particulate pigment; and

(d) forming an optical body comprising at least one layer of the condensation polymer.